

WHAT IS CLAIMED IS:

1. In a semiconductor laser light emitting device comprising:

a stacked film composed of a stack of group III nitride semiconductor films each containing at least one kind selected from aluminum, gallium, indium, and boron;

wherein an upper portion of said stacked film is formed into a ridge-like stripe, to form a current injection region;

a current non-injection region formed on both sides of said ridge-like stripe; and

at least part of said current non-injection region is made from a material expressed by a chemical formula $\text{Al}_x\text{Ga}_{1-x}\text{N}$ ($0 \leq x \leq 1.0$);

the improvement wherein

the component ratio "x" of Al is specified at a value in a range of $0.3 \leq x \leq 1.0$, so that said semiconductor laser light emitting device is configured as an index guide type semiconductor laser light emitting device.

2. A semiconductor laser light emitting device according to claim 1, wherein a current injection width Wst of said current injection region is specified at a value in a range of $1 \mu\text{m} \leq \text{Wst} \leq 3 \mu\text{m}$.

3. A semiconductor laser light emitting device according to claim 1, wherein part, present between an active layer and said current non-injection region, of said stacked film under said current non-injection region at least includes a film which is made from a material expressed by a chemical formula $Al_xGa_{1-x}N$ ($0.3 \leq x \leq 1.0$) and which has a thickness of $0.2 \mu m$ or less.

4. A semiconductor laser light emitting device according to claim 2, wherein part, present between an active layer and said current non-injection region, of said stacked film under said current non-injection region at least includes a film which is made from a material expressed by a chemical formula $Al_xGa_{1-x}N$ ($0.3 \leq x \leq 1.0$) and which has a thickness of $0.2 \mu m$ or less.

5. A semiconductor laser light emitting device according to claim 1, wherein a difference Δn between an effective refractive index n_1 of said current injection region in the film stacking direction and an effective refractive index n_2 of said current non-injection region in the film stacking direction is in a range of $0.007 \leq \Delta n = (n_1 - n_2) \leq 0.012$.

6. A semiconductor laser light emitting device according to claim 2, wherein a difference Δn between an effective refractive index n_1 of said current injection

region in the film stacking direction and an effective refractive index n_2 of said current non-injection region in the film stacking direction is in a range of $0.007 \leq \Delta n = (n_1 - n_2) \leq 0.012$.

7. A semiconductor laser light emitting device according to claim 3, wherein a difference Δn between an effective refractive index n_1 of said current injection region in the film stacking direction and an effective refractive index n_2 of said current non-injection region in the film stacking direction is in a range of $0.007 \leq \Delta n = (n_1 - n_2) \leq 0.012$.

8. A semiconductor laser light emitting device according to claim 4, wherein a difference Δn between an effective refractive index n_1 of said current injection region in the film stacking direction and an effective refractive index n_2 of said current non-injection region in the film stacking direction is in a range of $0.007 \leq \Delta n = (n_1 - n_2) \leq 0.012$.

9. In a semiconductor laser light emitting device comprising:

a stacked film composed of a stack of group III nitride semiconductor films each containing at least one kind selected from aluminum, gallium, indium, and boron; wherein an upper portion of said stacked film is

formed into a ridge-like stripe, to form a current injection region;

a current non-injection region formed on both sides of said ridge-like stripe; and

at least part of said current non-injection region is made from a material expressed by a chemical formula $\text{Al}_x\text{Ga}_{1-x}\text{N}$ ($0 \leq x \leq 1.0$);

the improvement wherein

the component ratio "x" of Al is specified at a value in a range of $0.15 < x < 0.30$, so that said semiconductor laser light emitting device is configured as a weak index type pulsation semiconductor laser light emitting device.

10. A semiconductor laser light emitting device according to claim 9, wherein a current injection width Wst of said current injection region is specified at a value in a range of $1 \mu\text{m} \leq \text{Wst} \leq 3 \mu\text{m}$.

11. A semiconductor laser light emitting device according to claim 9, wherein part, present between an active layer and said current non-injection region, of said stacked film under said current non-injection region at least includes a film which is made from a material expressed by a chemical formula $\text{Al}_x\text{Ga}_{1-x}\text{N}$ ($0.15 < x < 0.30$) and which has a thickness of $0.2 \mu\text{m}$ or less.

12. A semiconductor laser light emitting device according to claim 10, wherein part, present between an active layer and said current non-injection region, of said stacked film under said current non-injection region at least includes a film which is made from a material expressed by a chemical formula $Al_xGa_{1-x}N$ ($0.15 < x < 0.30$) and which has a thickness of $0.2 \mu m$ or less.

13. A semiconductor laser light emitting device according to claim 9, wherein a difference Δn between an effective refractive index n_1 of said current injection region in the film stacking direction and an effective refractive index n_2 of said current non-injection region in the film stacking direction is in a range of $0 < \Delta n = (n_1 - n_2) < 0.007$.

14. A semiconductor laser light emitting device according to claim 10, wherein a difference Δn between an effective refractive index n_1 of said current injection region in the film stacking direction and an effective refractive index n_2 of said current non-injection region in the film stacking direction is in a range of $0 < \Delta n = (n_1 - n_2) < 0.007$.

15. A semiconductor laser light emitting device according to claim 11, wherein a difference Δn between an effective refractive index n_1 of said current injection

region in the film stacking direction and an effective refractive index n_2 of said current non-injection region in the film stacking direction is in a range of $0 < \Delta n = (n_1 - n_2) < 0.007$.

16. A semiconductor laser light emitting device according to claim 12, wherein a difference Δn between an effective refractive index n_1 of said current injection region in the film stacking direction and an effective refractive index n_2 of said current non-injection region in the film stacking direction is in a range of $0 < \Delta n = (n_1 - n_2) < 0.007$.

17. In a semiconductor laser light emitting device comprising:

a stacked film composed of a stack of group III nitride semiconductor films each containing at least one kind selected from aluminum, gallium, indium, and boron;

wherein an upper portion of said stacked film is formed into a ridge-like stripe, to form a current injection region;

a current non-injection region formed on both sides of said ridge-like stripe; and

at least part of said current non-injection region is made from a material expressed by a chemical formula $\text{Al}_x\text{Ga}_{1-x}\text{N}$ ($0 \leq x \leq 1.0$);

the improvement wherein

the component ratio "x" of Al is specified at a value in a range of $0 \leq x \leq 0.15$, so that said semiconductor laser light emitting device is configured as a gain guide type laser light emitting device.

18. A semiconductor laser light emitting device according to claim 17, wherein a current injection width Wst of said current injection region is specified at a value in a range of $1 \mu\text{m} \leq \text{Wst} \leq 3 \mu\text{m}$.

19. A semiconductor laser light emitting device according to claim 17, wherein part, present between an active layer and said current non-injection region, of said stacked film under said current non-injection region at least includes a film which is made from a material expressed by a chemical formula $\text{Al}_x\text{Ga}_{1-x}\text{N}$ ($0 \leq x \leq 0.15$) and which has a thickness of $0.2 \mu\text{m}$ or less.

20. A semiconductor laser light emitting device according to claim 18, wherein part, present between an active layer and said current non-injection region, of said stacked film under said current non-injection region at least includes a film which is made from a material expressed by a chemical formula $\text{Al}_x\text{Ga}_{1-x}\text{N}$ ($0 \leq x \leq 0.15$) and which has a thickness of $0.2 \mu\text{m}$ or less.

21. A semiconductor laser light emitting device

according to claim 17, wherein a difference Δn between an effective refractive index n_1 of said current injection region in the film stacking direction and an effective refractive index n_2 of said current non-injection region in the film stacking direction is in a range of $0 < \Delta n = (n_1 - n_2) < 0.007$.

22. A semiconductor laser light emitting device according to claim 18, wherein a difference Δn between an effective refractive index n_1 of said current injection region in the film stacking direction and an effective refractive index n_2 of said current non-injection region in the film stacking direction is in a range of $0 < \Delta n = (n_1 - n_2) < 0.007$.

23. A semiconductor laser light emitting device according to claim 19, wherein a difference Δn between an effective refractive index n_1 of said current injection region in the film stacking direction and an effective refractive index n_2 of said current non-injection region in the film stacking direction is in a range of $0 < \Delta n = (n_1 - n_2) < 0.007$.

24. A semiconductor laser light emitting device according to claim 20, wherein a difference Δn between an effective refractive index n_1 of said current injection region in the film stacking direction and an effective

refractive index n_2 of said current non-injection region
in the film stacking direction is in a range of $0 < \Delta n =$
 $(n_1 - n_2) < 0.007$.